Industrial Standardization

and Commercial Standards Monthly

October

American Standard for Safety in Construction

(See Article on Page 246)

Cover photo by Richard Wurts

1939

Standardization's Tool—
Preferred Numbers

TO many engineers and other technical men, the term "Preferred Numbers" has no specific meaning but suggests a more or less mysterious problem. As a matter of fact, however, "Preferred Numbers" are not complicated or difficult to understand, but on the contrary, offer a simplified and easy system for designing or selecting any progression of sizes. (In his article on pages 265-269 of this issue, H. W. Tenney clearly explains what Preferred Numbers are and how they can be used.)

Unfortunately, the popular misconception of the nature of preferred numbers has worked against their general acceptance, and even technical committees of the American Standards Association faced with problems of standard sizes and dimensions frequently overlook the possibility of using the Preferred Number system in the standards developed by them.

To remedy this situation, it is strongly recommended that all chairmen and secretaries of ASA technical committees bring the American Standard system of Preferred Numbers to the attention of their members and that all ASA members seriously consider their use whenever a series of sizes or dimensions is under discussion.

—R. E. Hellmund, Chairman, ASA Committee on Preferred Numbers; chief engineer, Westinghouse Electric & Manufacturing Co.

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Industrial

Standardization

Combined with Commercial Standards Monthly

Published Monthly by

American Standards Association
29 West 39th Street, New York

with the cooperation of the National Bureau of Standards

RUTH E. MASON, *Editor*

This Issue

Our Front Cover: **American Standard Manual of Accident Prevention in Construction is designed to help reduce the huge construction accident bill, amounting to millions of dollars annually. Photo by Wurts Bros.**

ASA

Reg. in U. S. Pat. Off.

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Subscription price $4.00 per year U. S. and Canada (foreign $5.00); Special to schools and libraries $2.00 (foreign $3.00); single copies 35 cents

October, 1939 **Vol. 10, No. 10**

ASA Offers Cooperation To War Resources Board

"IN the belief that standards are bound to play an important role in the problem of industrial preparedness, I am writing to offer the use of the facilities of the American Standards Association to the War Resources Board," wrote Edmund A. Prentis, president of the American Standards Association, to E. R. Stettinius, Jr., chairman of the War Resources Board, September 12.

Mr. Stettinius replied: "At the present time the War Resources Board is serving in a purely advisory capacity to the Army and Navy Munitions Board. I feel, however, that the question of standards merits careful consideration in the development of any plans for industrial mobilization, and in order that this subject may have proper consideration, I am passing your letter along to Colonel H. K. Rutherford, head of the Planning Branch of the War Department, as well as Secretary of our Board."

Colonel Rutherford's reply opens the way for active cooperation by the ASA. He said:

"I agree with you that standards have a most important part in the problem of preparedness. The American Standards Association has always cooperated with the War Department and your offer of further cooperation is appreciated . . . I would be glad to have any comment or suggestions which you may offer concerning the part which the American Standards Association might take in this general plan."

In carrying out the suggestions for cooperation, conferences between representatives of the American Standards Association, the Ordnance Department, and the Army and Navy have already resulted in an arrangement whereby the American Standards Association receives copies of Ordnance Standard drawings in cases where the Department needs assistance. ASA committees are now studying standardization problems on machine pins, ball and roller bearings, plain and lock washers, square threads, and acme threads presented by the Department.

Although the Army and Navy have not so far taken the initiative in asking the ASA for new work, American Standards which apply to their problems are now being used by them, the conferences revealed.

The ASA Board of Directors and Standards Council at their meetings September 27 and 28 discussed the problem of how to proceed in order to be of the most value to the Government.

One of the principal services the ASA can perform, it was said at the Council meeting, is in helping to resolve "bottlenecks" which occur in large-scale production. Certain types of bottlenecks can be solved in whole or in part by the use of standards, it was said, for instance, fitting of parts, setting of proper tolerances, and review and development of specifications which assure satisfactory material at the least possible expenditure. Some of these bottlenecks are difficult to locate until mass production actually gets under way. Some are already known and immediate attention should be directed to these, it was said during the discussion. Government departments might well take the initiative in asking the ASA for help, it was suggested.

Government officers expressed the opinion that in a national emergency the value of the ASA would not be limited to standards for materials for military use. Standards would be needed to bring about better utilization of materials under emergency conditions throughout the entire national economy, they said.

In such an emergency, standardization committees can be asked to cut through their normal routine and speed their work, particularly where minor issues may be delaying cooperative agreement on standards of fundamental importance, the Standards Council decided. The Council formulated its policy as shown above.

RESOLVED, That in the opinion of the Standards Council the best method for the ASA to assist the Federal Government during possible emergency periods would be for ASA committees to carry on their work with all possible diligence so that standards urgently needed by the military services can be made available in the shortest possible time;

RESOLVED, That the Standards Council recommends that such committees give special preference to suggestions from military authorities; and

RESOLVED, That copies of this resolution be forwarded to members of all such ASA committees developing standards of particular interest to the military services.

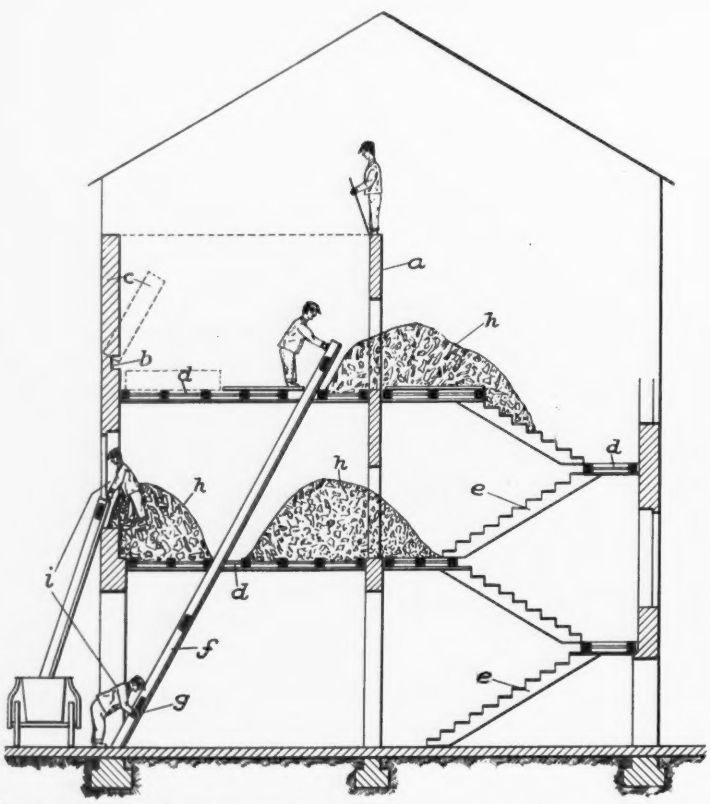
—Adopted by the ASA Standards Council September 28.

ASA Approval Shows National Consensus On Manual for Safety in Construction

NATIONAL agreement on the provisions of the revised Manual of Accident Prevention in Construction, prepared by the Associated General Contractors of America, was shown recently when the American Standards Association approved the Manual as an American Recommended Practice. The ASA Committee on Safety in Construction Work, on which are represented 18 national organizations of architects, contractors, building officials, safety organizations, and government agencies, as well as others concerned with safety in construction, studied the Manual and recommended its approval by the ASA.

The Manual, originally prepared by the AGC in 1927 as a safety guide to contractors, is designed to help reduce the huge construction accident bill amounting to millions of dollars annually. A saving of $194,000,000 would result if only one-half the accidents in the construction field were prevented, the AGC estimates, in addition to benefits from improved working conditions, avoidance of suffering, and conservation of man-power.

Instructions for safe use of equipment such as hoists and derricks, ladders, hand tools, boilers, scaffolding, and trucks, as well as recommendations for safe methods in demolition, handling and storage of material, loading and



Courtesy The Travelers Insurance Company

Fig. 1

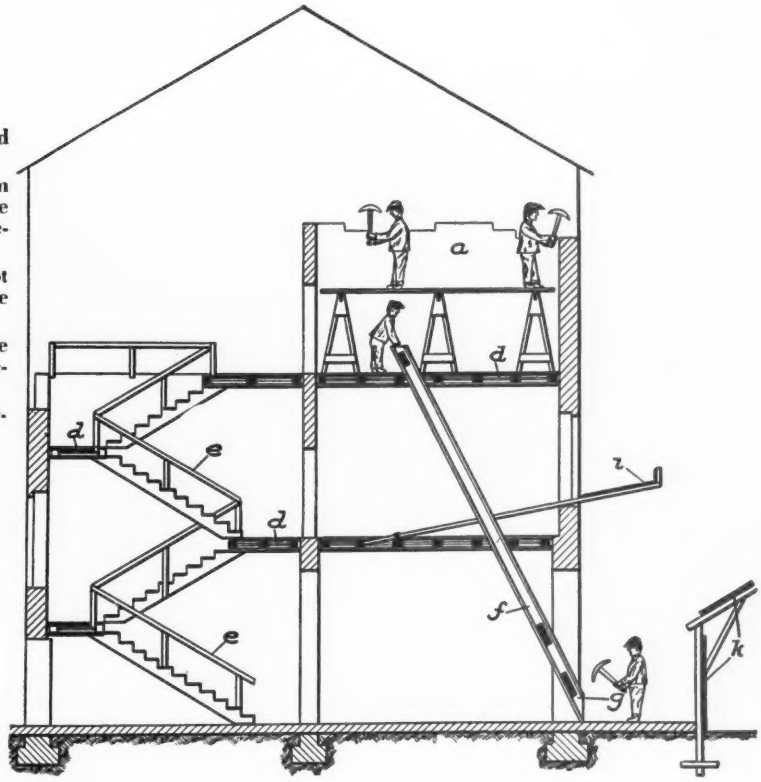
House-wrecking: Dangerous Methods

- **a. Thin, shaky, or insecure walls should be scaffolded.**
- **b. Walls and columns must not be undermined.**
- **c. Sections of wall should not be thrown down bodily upon the floors.**
- **d. Floors or joist-layers upon which work is being done should be tightly covered over with boards.**
- **e. Stair railings should be left in position as long as possible.**

Diagrams reproduced from American Standard Manual of Accident Prevention in Construction.

Fig. 2
House-wrecking: Safe Methods

f. Chutes must be fully enclosed on all sides.
g. Do not remove materials from the chutes with the hands. Use picks or other suitable implements.
h. Wreckage and rubbish must not be stored upon the floors of the building.
i. Men should not work one above another without adequate safeguards.
k. Plank shields for protecting persons on the street.



handling vehicles, and equipment upkeep, are covered in the Manual. Good practice in camp sanitation and housing, clothing, inspection, and first aid is also recommended.

The new edition adds many sections not included in the edition approved by the ASA in 1934. New material on explosives, particularly electric blasting, has been added, as well as information concerning safe practices on power-driven shovels, recommendations on first-aid treatment, and a new section on cofferdams. The provisions on pile driving have been expanded, additional material added on scaffolding, and an entire new section on ladders included. New sections on pneumatic and electric tools, on unfired pressure vessels, and on occupational diseases have been added.

After studying the revised Manual, the ASA committee recommended a change to bring the methods of computing days lost through temporary disability into conformity with the provisions of the American Standard Method of Compiling Industrial Injury Rates. The change provides that all calender days lost be computed, including Sunday, whereas the provisions in the Manual had provided that Sundays should not be counted. The Associated General Contractors of America have accepted the recommendations of the committee and have issued an "errata sheet" calling attention to the change.

The Manual of Accident Prevention in Construction is at present the only source of safety information for the construction industry. The ASA committee which recommended its approval, however, is now working on a Safety Code for Construction Work to include detailed specifications for safe practices in all phases of construction on buildings. It will be in a form suitable for use by regulatory bodies which wish to adopt safety rules for construction. The ASA committee has practically completed 12 sections of the proposed Safety Code for Construction Work, as follows:

General Safety Rules for Employees	**Blasting**
Demolition	**Compressed Air Work**
Excavation Work	**Derricks**
Piling	**Scaffolds**
Handling and Storing Materials	**Ladders**
	Material Hoists
	First Aid

Additional sections are under consideration covering:

Railings and Toe Boards	**Salamanders**
Floor and Wall Openings	**Housekeeping**
Temporary Electrical Wiring	**Steel Erection**

The Manual, which is broader in scope than

the safety code, applies to other types of construction as well as that on buildings, and is expected to supplement the safety code by helping contractors to apply the code to specific conditions. The provisions of the two documents will be coordinated by a joint committee of the Associated General Contractors of America and the American Standards Association when the safety code is completed.

Copies of the American Recommended Practice Manual of Accident Prevention in Construction (A10.1-1939) (1938 edition of the Associated General Contractors of America) is now available from the American Standards Association at $2.00.

Standardization Technique Triumphs In New "Sealed Beam" Headlamps

THE 1939 Automobile Show in New York, October 15-22, provides an example of cooperation in preparing and using a standard for automobile equipment unique in the history of the automobile industry. As a result of this effort on the part of all concerned, almost every one of the 1940 models exhibited will have as built-in equipment a new standard "sealed beam" headlamp, developed through the cooperation of automobile lighting equipment manufacturers, safety organizations, motor vehicle administrators, and automobile manufacturers.

The new headlamps were developed as the result of a long-recognized need for safer seeing conditions for night driving, statistics proving that two-thirds more accidents happen at night than during the day despite the heavier daytime traffic. They are built into the car as a complete unit in which lens, reflector, and light source are all assembled permanently, and sealed to prevent dirt, dust, or moisture from filtering in and dimming the light. The design has the advantage of keeping all the elements in exact alignment with each other. The aiming adjustment has been standardized so that service men may learn only one procedure to aim the lights on any car equipped with the new system.

The lamp has two beams. The "traffic beam" designed to protect oncoming traffic from glare provides a wider spread of light to illuminate the sides of the road and to send as much light down the right edge of the pavement as possible. The "country beam," for use when no cars are approaching, provides more light than had previously been possible.

The lamp has been designed to give longer service as well as to maintain its brilliance. It is estimated that the sealing of the unit will mean that the amount of light will be reduced less than 10 per cent during the entire life of the unit, whereas with the old type of headlamp, neglect in having the lamps cleaned and cared for regularly sometimes reduced the amount of light by 50 per cent or more.

In attempting to solve the problem of better lighting for night driving, specific recommendations were made by each group concerned. The automobile manufacturing industry and the lighting equipment manufacturers pooled their engineering resources, and worked in cooperation with the American Association of Motor Vehicle Administrators, the Society of Automotive Engineers, and the Illuminating Engineering Society in developing plans for the new lamp. Help of the motor vehicle administrators was particularly needed in solving the problem presented by conflicting laws and regulations in many of the states.

The major objectives of the program were outlined in seven points:

1. The new system must provide safer seeing under all the various conditions encountered in night driving.

2. It must provide relief from glare when meeting other cars and in urban areas.

3. It must be easy for the driver to understand and to use—so that he will make use of the right beam at the right time.

4. It must maintain its lighting efficiency so that as cars grow older they will continue to have as safe lighting as newer ones.

5. It must be simple to adjust so that lamps may always be aimed to give best illumination.

6. It must simplify the distribution of repair parts so that owners can get convenient replacement service when required.

7. It must simplify the work of officials responsible for the enforcement of headlight laws and regulations.

Formal standardization proceedings are now under way by the Lighting Division of the Standards Committee of the Society of Automotive Engineers and the Committee on Motor Vehicle Lighting of the Illuminating Engineering Society.

If approved by the Society of Automotive Engineers as an SAE standard, the new specifications for sealed beam headlamps will not replace the present SAE standard for headlamps for motor vehicles.

Standard Specifications and Tests to Help Users of Indicating Pressure Gages

New American Standard defines sizes and dimensions, outlines grades of accuracy, and establishes gage classifications and definitions

by

Arthur Huntress[1]

Secretary, Subcommittee 2 on Definitions, ASA Committee on Specifications for Pressure and Vacuum Gages

THE new American Standard for Indicating Pressure and Vacuum Gages, recently granted approval by the American Standards Association, represents the result of the combined efforts of a large number of men and organizations over a period of more than eight years. The very length of time involved in this development gives true evidence as to the difficulty often encountered in reaching agreement on the details of what at first appears to be a relatively simple matter.

In July, 1928, the American Society of Mechanical Engineers presented a formal request for a standard covering pressure and vacuum gages to the American Standards Association. Preliminary investigation by the ASA, among individuals representing producer, user, and general interests showed a large number in favor of the proposal. In May, 1930, a general conference on the subject was conducted by the ASA and in December of the same year an ASA sectional committee held its organization meeting and began the actual work of development.

The committee was composed of nearly 50 members, about one-fifth representing producers, a little over half representing users or consumers, and the remainder being from miscellaneous general interests. Many organizations representing particular interests or industries on a national scale, in such fields as electric light and power, gas, railways (steam and electric), chemical, refrigeration, petroleum, heating and ventilating, marine, fire protection, building owners and managers, purchasing agents, National Bureau of Standards, U.S. Lighthouse Service, and U.S. Navy, were represented on the committee.

What the Standard Covers

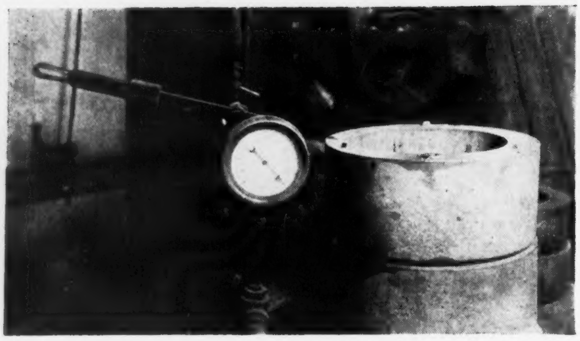
The standard which this committee worked out is confined to "round, dial-type, indicating gages utilizing an elastic chamber for confining the pressure medium. It does not include deadweight types, mercury-floated piston types, or other special constructions which do not utilize an elastic chamber."

It establishes basic gage classifications and gives quantitative definitions covering pressure characteristics ("steady, fluctuating, and pulsating") for the promotion of better understanding between maker and purchaser. Basic definitions of five main varieties of single and multiple elastic chamber gage constructions and certain other varieties covering specific service and types of construction are included. Subsections cover the nomenclature and definitions of structural details and auxiliaries and clarify the terms covering manufacturing and operating variables, such as accuracy, precision, sensitivity, and variance.

General requirements in section 3 to 9 include sizes and dimensions, grades of accuracy, dial ranges, and certain requirements in regard to the details of the dial.

Definite requirements in sections 10 and 11 cover three grades of accuracy, including the acceptable calibration apparatus and test procedure for proving grades of accuracy.

[1]Standards Department, Ingersoll-Rand Company, Phillipsburg, N. J.; alternate representative for the National Association of Purchasing Agents on ASA Committee on Specifications for Pressure and Vacuum Gages (B40).



Courtesy Richardson & Boynton Co.

This pressure gage is being used in testing a hot-water heater. In laboratory tests pressure and vacuum gages are widely used for many kinds of fluids

The final section gives some general rules for installation and use. The standard ends with a suggested gage purchase specification form for general use of manufacturers and users (Appendix 1) and a sample table showing results of the test of a gage for compliance with the accuracy requirements (Appendix 2).

General Objects

The three principal objects of all standardization work of this nature are (1) to make the products of different manufacturers interchangeable in use with a minimum of difficulty to the user, (2) to reduce or eliminate excessive or useless variety in the product, and (3) to set up certain standards of excellence in performance or, in other words, to establish grades of quality and lay down methods of comparison.

It should be noted that none of the above objectives are contrary, in the slightest degree, to the objects and practice of honest competition. On the contrary, they tend to reduce the cost of manufacture and enable the user to buy on a basis of greater certainty as to comparative dollar value and general usefulness. Furthermore, these efforts are practically sure to result in a certain amount of general improvement due to honest cooperation on the part of all the parties involved.

Some of the Problems

The work of the committee was divided into three main fields of activity. The one which would occur to many as of primary interest covered such purely mechanical aspects as deciding on a list of nominal sizes and dimensions. For practical reasons the selection of a list of sizes had to be made from those already in common use, generally over a long period. After the actual list of sizes was agreed upon, it was necessary to decide on certain other details, such as limiting outside dimensions, arrangement and dimensions of mounting holes, standard list of dial (pressure) ranges, values for various graduations of the dial and certain other rules as to the actual dimensions, proportions, and general layout of the dial, size of pressure connections, etc.

Nominal Sizes

In considering the question of nominal sizes alone, the subcommittee found 15 different nominal sizes manufactured in the range from 2 to 12 inches inclusive. This was reduced to nine sizes and was afterwards reduced to eight by eliminating the two-inch size and making $2\frac{1}{2}$ inch nominal the smallest size covered by the standard. The list of nominal sizes is as follows: $2\frac{1}{2}$, $3\frac{1}{2}$, $4\frac{1}{2}$, 5, 6, $8\frac{1}{2}$, 10, and 12 inches.

Dial Ranges

The subcommittee considering the question of dial (pressure) ranges found 29 ranges manufactured between 15 pounds and 25,000 pounds maximum pressure. This was reduced to 17 ranges covering the field between 15 pounds and 20,000 pounds maximum pressure. In the very commonly used bracket of 15 pounds to 200 pounds there were 11 ranges commonly made. This was reduced to five ranges as follows: 0 to 15, 30, 60, 100, and 200 pounds, for all gages except pressure-vacuum, ammonia, and hydrostatic-head.

To some readers it might seem that this problem was not like the previous one (Nominal Sizes) and they might question the sufficiency of choice provided. It seems to be commonly accepted as good practice that for most satisfactory results the actual gage to use for any given continuous service pressure should be of such pressure range that the maximum service pressure will lie somewhere within the middle 20 or 30 per cent of the scale, that is, not exceeding 10 to 15 per cent one way or the other from mid-scale. A little calculation will show that any service pressure can be covered on such a basis providing the scale ranges bear some definite ratio to each other. Another angle to this question is the series of service pressures covered by the American Standards for pipe fittings and some of the service conditions commonly found in industry.

In order to show the relations between the pressure ranges selected for the gage standard, some common industrial conditions, and the American Standards for pipe fittings, we have tabulated some of these figures for comparison. This table shows the per cent of the total scale range which the service pressure represents in each case, and

shows that the choice of pressure ranges is sufficient. This table shows the 15 gage ranges from 60 to 20,000 pounds, the 15 and 30 pound gages being left out for obvious reasons.

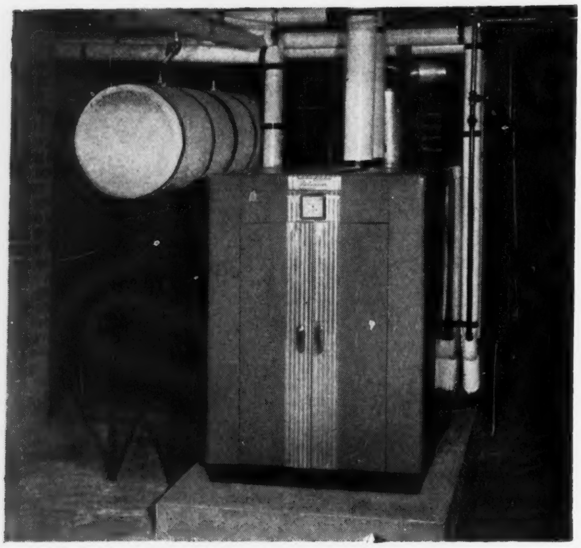
In several of the cases shown in the table below, it is quite possible to use a gage having a pressure range other than the one shown to cover the given service pressure, and still stay within the limitations of good practice. We have merely shown the particular gage having the pressure range which appears to be a conservative choice in each case. For instance, either a 200 or 300 pound gage could be used for 125-pound service and a 600 or 800 pound gage could be used for 400-pound service. In both cases we would come within the recommendation contained in the Rules for Installation and Use and headed "Working Pressure Limits," which reads "The maximum working pressure of the gage, under steady pressure, should not exceed two-thirds of the maximum pressure provided on the scale, if accurate indication is to be maintained and long life for the elastic-chamber is expected."

Dial Details

In order to promote a high degree of visibility and to reduce the chances of error in reading a gage, the standard also establishes some limitations on the actual details of the dial. For instance, the figures "shall be of the plain unshaded type and shall be placed in a position so as to be vertical when the gage is vertical, except on combination-scale gages, when radial figures may be used on the outer scale." It was also proposed to put limits on the actual figure sizes but this was omitted in the standard in its final form.

Many different values for the minor or smallest graduations were also found in actual use. It is obviously a distinct and unnecessary handicap to the user to have the minor graduations mean one thing on one gage and something different on a gage of the same size, pressure range, and type of service made by another manufacturer. Our watches all show one-minute minor graduations and five-minute index graduations. Most people would not like it if some watches had five two-

Am. Std Pipe Fittings				Gage		Some common industrial uses
Am. Std	*Service & Pressure*			*Scale Max.*	*Per cent of max.*	
	Steam	*Hyd.*	*Test*			
B16b2	25			60	41.7	Process steam and air
"		43		100	43.	
B16a	50			"	50.	
"	80			200	40.	Steam and air plants of moderate pressure
"	100			"	50.	
"	125			300	41.7	
B16e	150			"	50.	
B16a		175		400	43.7	Locomotives, small to medium turbines and 2-stage air plants
B16b	250			600	41.7	
B16e	300			"	50.	
"			350	800	43.7	
"	400			"	50.	
"		500		1000	50.	
B16e	600			1500	40.	Large modern turbines and medium pressure 3-stage air plants
"			750	"	50.	
"	900		900	2000	45.	
"			1000	"	50.	
"			1200	"	60.	
B16e	1500		1500	3000	50.	High pressure 3 to 6 stage compressor plants and extreme conditions of all kinds
"			1800	"	60.	
"			2000	5000	40.	
"	2500			"	50.	
"			3500	10000	35.	
"			4200	"	42.	
"			6000	15000	40.	
"			7200	"	48.	
"				20000		



Courtesy Richardson & Boynton Co.

Gages covered by the new American Standard indicate pressure or vacuum in home heating installations as well as in large industrial steam plants

minute graduations in 10-minute index periods and others had four $2\frac{1}{2}$-minute graduations in 10 minutes, in addition to our commonly used one-minute graduation arrangement.

In the new standard the value of the minor or smallest graduation on all dials of the same size and pressure range is the same for all Grade AA gages. ("Grades" are discussed later.) However, as these gages are used where a high degree of precision is required in reading, the 10-and 12-inch sizes have smaller values in some scale ranges than the $8\frac{1}{2}$-inch and smaller sizes. This is because of the fact that the length of the scale in the large sizes is sufficient to allow smaller values and yet maintain space intervals which can be easily and accurately read. In other words this situation is something like the difference between the kind of a dial which is useful for a good common watch and a stop watch. For the same reason the minor graduations on all Grade AA gages are, in every case, not more than half the value of those for Grade A gages.

All Grade A and B common pressure gages for 100-pound range and above, and $8\frac{1}{2}$-inch size and smaller (with two exceptions) have equal values for the minor graduations. There is some little difference outside of these pressure and size brackets. It will be seen that the situation has not been reduced to a single scale of minor graduations for all similar pressure ranges and sizes but it is true that the situation has been somewhat simplified.

Certain other limitations have been placed on the size and arrangement of the graduation lines, the graduation arc and the indicating pointer, all for the purpose of promoting a high degree of visibility.

Accuracy Requirements

Sections 10 and 11, covering Accuracy Requirements and Test Methods, are a very important part of the standard. They were worked out under the supervision of the National Bureau of Standards' representative on the committee and with the active collaboration of the representatives of the cooperating gage manufacturers. Three "Grades of Accuracy" are established, Grade AA, Test Gages; Grade A, High-Grade Commercial Gages; and Grade B, Commercial Gages. These grades shall show degrees of accuracy as follows:—

Grade AA—The error in pressure indication, either in the up direction or in the down direction at any point in the scale, shall not exceed one-half of one per cent of the maximum pressure for which the scale is graduated.

Grade A—The error in pressure indication, either in the up direction or in the down direction—at any point above 25 per cent and below 75 per cent of the maximum pressure to which the scale is graduated, shall not exceed one per cent of the maximum pressure to which the scale is graduated, and for the rest of the scale one and one-half per cent . . .

Grade B—The error in pressure indication . . . in the middle half of the scale shall not exceed two per cent . . . and for the rest of the scale three per cent . . .

For Grade AA gages the specified test is that the gage "shall be subjected to a pressure equal to the maximum scale pressure" and that "this pressure shall be maintained for a period of not less than 5 hours. Within 10 minutes after the pressure is released . . . the gage shall be tested over its entire scale, with readings taken both up and down." The allowable errors are as stated in a preceding paragraph. The tests for Grade A and B gages are over the entire scale but the five-hour period at maximum pressure is not specified.

In order that there shall be no misunderstanding on this point it should be noted that the standard does not make it mandatory that all gages shall be tested, the opening words of Section 10 being, "Gages shall be capable of withstanding tests and shall show degrees of accuracy as follows." One important provision in this connection, however, is the specification that "To be classed as American Standard, the dial must bear an inscription giving the Grade of Accuracy. . . ."

The section covering Test Methods lays down the rules and recommendations covering Calibration Apparatus and Test Procedure for all grades and pressure ranges of gages.

The final section, "Rules for Installation and Use," contains miscellaneous information principally for the benefit of the user, as the title indicates. The appendixes 1 and 2, containing a suggested gage purchase specification form and sample form for accuracy compliance test, are in no way official forms. However, it is believed that they will serve a useful purpose in the standard.

As to types of equipment for which the gages covered by this standard may be used, there is not much to be said except that they include all types where gages of this general nature have been used heretofore.

In closing, it should be said that the committee realizes that, as in all first efforts of this kind, the standard will, without doubt, have to be revised from time to time as experience accumulates. However, it is believed that the collection and sifting of data, experience, and opinions in the preparation of the standard was sufficient and thorough enough to provide a sound beginning.

Representative Committee Shows Interest in Gages

The wide use of pressure and vacuum gages and interest in their standardization is shown in the membership of the ASA committee working on Specifications for Pressure and Vacuum Gages (B40). This committee is a representative group bringing together organizations concerned with the manufacture or use of pressure and vacuum gages, and technical experts. The committee is under the leadership of the American Society of Mechanical Engineers.

The American Standard for Indicating Pressure and Vacuum Gages (B40.1-1939) is available from the American Standards Association at 40 cents per copy. ASA Members are entitled to a 20 per cent discount.

National Bureau of Standards' Tests Show More Accuracy in Knock Ratings

An increase in accuracy in tests for knock rating of fuels in 1939 over comparable tests made in 1936 was reported by the National Bureau of Standards, which recently analyzed 6,386 cooperative knock ratings on 136 fuels at the request of the Cooperative Fuel Research Committee. The tests had been carried out by more than 100 laboratories, according to the *Technical News Bulletin*, September. A similar analysis had been made by the Bureau of 2,180 cooperative knock ratings on 99 fuels in 1936. Tests made by the Cooperative Exchange laboratories in accordance with the ASTM standard test method showed that 92.5 per cent of the results deviate from the respective mean values by less than one octane unit, as compared with 86.9 per cent in the 1936 analysis. The precision of rating average fuel, it was found, is now 0.52 octane unit as compared with the value 0.63 found in the earlier analysis. The maximum precision attainable with present apparatus is estimated to be 0.36 octane unit. This estimate is supported by the fact that 207 tests by the best two laboratories show a precision of 0.40 octane unit.

It was found that precision of rating by the 1939 CFR Research Method is close to that for the ASTM Method, while the 1932 CFR Research Method shows two-thirds larger error than the revised version. The current L-3 Method, the Bureau reports, is but slightly inferior to the ASTM method.

The analysis showed the same effect from atmospheric and engine variables as had been found in 1936. For example, the report shows, more attention should be given to obtaining standard intensity of knock, the limit on hours between engine overhaul should be observed, and humidity should be controlled if precision is to be improved.

ASA Asks Data On Safety Glass

The American Standards Association has asked the national standardizing bodies in 25 other countries to furnish any data available about danger of imprisonment following an accident in a motor vehicle in which safety glass is used. The ASA committee on the safety code for safety glass is studying the problem in connection with the provisions of the American Standard.

New Foreign Standards Available To Members From ASA Library

New and revised standards recently received by the American Standards Association from national standardizing bodies in other countries include many subjects of interest to American industries. The standards listed below are published in the language of the country from which they were received.

Copies may be borrowed or purchased from the ASA. When ordering copies please refer to the number as well as the title of the standard.

Australia

Pigments for paints: oxides of iron, natural sienna and umber, ochre (K.59 to 65-1939)
Black pigments for paints (K.66 to 69-1939)
Jarrah and Karri (O.10, 11, and 14 to 43-1938)
X-ray code (CC.2-1939)
Plumbing fixtures for public institutions (No. 10 Part 7, Sec. 1, 2, 4 to 11)
Rubber-tired castors for hospital furniture (No. 10 Part 8, Sec. 12)
Staff beds for use in public institutions (No. 10 Part 9, Sec. 6)
Miniature over-current circuit-breakers (C.111-1938)
Bayonet lampholders (C.117-1939)
Electric hand-lamps (C.118-1939)
Plug socket adaptors (C.122-1939)
Petrol service pumps (C.123-1939)
Overhead line connector boxes (C.124-1939)
Electric razors (C.125-1939)

Amendments to Australian Standards

Road grader cutting edges and tynes, and road roller tynes (A.40-1939)
SAA Lift (Elevator) Code (CA.3-1938)
SAA Wiring Rules (CC.1-1934) Amendment March, 1939
Definitions and General Requirements for Electrical Materials and Equipment (C.100-1939)
Electric grillers (C.102-1939)
Electric portable immersion heaters (C.104-1939)
Electric kettles and saucepans (C.105-1939)
Apparatus connectors (C.109-1939)
Plugs and plug sockets (C.112-1939)
Normal bayonet lampholder adaptors (C.119-1939)
Clinical thermometers (No. 10 Part 4, Sec. 1)

Revised Australian Standards

Springs and spring steel for railway rolling stock (E.2 to 5-1938) (supersedes 1930 edition)
Carbon steel castings for railway rolling stock (E.7-1938) (supersedes 1925 edition)
Milled flooring, lining and weatherboard (O.3 to 5-1939) (supersedes 1934 edition)

Finland

Metric fine threads, pitch 0.5 mm (B.I.26)
" " " " 0.75 mm (B.I.27)
" " " " 1.0 mm (B.I.28)
Comparison between SFS (Finnish) and ISA tolerances—comparison rules (BI 201); hole tolerances (BI 202; 203) shaft tolerances (BI 204; 205)
Rivets with conical head for shipbuilding (FI.11)
Rivets with countersunk head for shipbuilding (FI.12)
Rivets with rounded countersunk head for shipbuilding (FI.13)

Holland

Rubber pneumatic hoses, heavy construction, dimensions and specifications for testing (N 165)
Pipe conduits and accessories. Bronze and brass threaded couplings for gas and water conduits. Light union nuts and joint rings (N 378)
Motor cars. Directions for brakes I and II (N 504, N 505)
Motor cars. Specifications for the lights I, II, and III (N 506, N 507, N 508)
Motor cars. Specifications for direction-indicators (N 594)
Shipbuilding details. Blocks (N 642, N 649)
Tolerances on screw bolts, screws and nuts (N 731) (N 731)
Holes for screw bolts and screws (N 769)
Shipbuilding details. Davits with pins and accessories (N 832)
Pipe conduits and accessories. Cast iron flanged pipes (N 857)
Pipe conduits and accessories. Cast-iron flanged bends, flanged tees, flanged crosses (N 875)
Paraffine. Determination of the setting point (N 889)
Mineral oils and similar products. Determination of the ash content (N 890)
Colors for printers' ink (N 903)
Safety code for central heating installations (N 1002)
Specifications for sampling and testing of coal and coke (N 1011)
Pipe conduits and accessories. Cast iron 95 deg branches with spigot and socket ends. Dimensions (N 1111) Weights (N 1112) Number plates (N 1147, N 1148)
Shell-lime, shell-lime powder H.M. and ordinary shell-lime powder. Definitions and specifications (N 1158)
Indication signals II and III (N 1176, N 1177)
Signals for right of way (N 1178)
Traffic pillars (N 1179)

Revised

Pipe conduits and accessories. Round screwed flanges with collar for gas and steam pipe for pressures I-6, II-5 and I-10, II-8 (N 239)
Warning signals (N 510)
Prohibitive signals (N 511 — N 519)
Indication signals (N 517)
Technical drawings. Indications on charts and drawings of situations and ground works (N 616)

Sweden

Name of parts. Hand levers (JTS-56); foot levers and pedals (JTS-57); adjusting screws and cranks (JTS-58)
Drain pipes of burnt earthenware (JTS-60)
Bed pans (SSK-18)
Transport cars for invalids (SSK-29)
General testing methods for cotton, linen, and woollen materials (SSK-30)
Cotton material for overalls (SSK-38); dress-material for female attendants (SSK-40); for patients' clothes (SSK-41); costume-material for male attendants (Cadet cloth) (SSK-42); mattress-material, striped (SSK-44); mattress-material, star design (SSK-45); table napkins (SSK-46)
Linen, kitchen towels (SSK-65)
Linen, bath sheets (SSK-68)
General manufacturing regulations for felting (SSK-70)

ASA Committee Influences New Trend In Sizes for Children's Clothes

A CHANGE in emphasis toward measurements rather than age in selecting the size of children's clothes is shown in fall and winter catalogs of retail stores as well as in data provided by manufacturers on garment labels. The new trend can be directly traced to the work of the ASA committee on sizes of children's garments. The ASA committee found, as the result of the research work done by the U.S. Bureau of Home Economics, that age is the worst possible index of size, but that a height and width measurement together give the best indication of a good fit.

Manufacturers to Use Measurements

Following this the United Infants' and Children's Wear Association has announced that its members will adopt a policy of tagging garments with chest and length measurements. Jacob J. Lubell, president, and Max H. Zuckerman, executive secretary of the United Infants' and Children's Wear Association, are members of the ASA committee.

The Association's action does not cover the entire field of children's clothing, but many retail stores are making provisions to help customers buy according to measurements if the information should not be shown on the tag.

R. H. Macy, New York, for instance, devotes a page in its new catalog to a row of sketches illustrating how a child should be measured, and captions it, "What size does your child take? Macy's shows you how to tell." The customer is then told, "Turn to the back of this page and see how these measurements correspond with actual Macy sizes." The back page gives measurements for clothes from babyhood through the teen age, and a table of sizes corresponding to the measurements. In girls' fashions, sizes are gaged by length measurements, while in boys' clothes, chest and waist measurements are also used as a guide.

Lord & Taylor, New York, says, "To avoid mistakes due to individual differences in size, simply tell us the age of your child plus her weight, chest, and waist measurements. We will select the right size for her. Of course, if you're sure your child is the usual size for her age you may order by the sizes mentioned in the catalog."

For nearly a year, Marshall Field, Chicago, has been marking girls' clothes in inches instead of age sizes, and asking manufacturers who supply garments to put chest, waist, and length measurements on garment tickets.

Reporting on the success of this year's experiences, the *Retail Ledger*, July 15, says:

"Almost nine months' successful experience in marking children's clothes by inch-measurements instead of by age, as formerly, has convinced Marshall Field's (Chicago) that the move is a sound one. Returns are much lower, clothes fit far better, and customers, more and more, are bringing in their children's measurements when they buy."

Most mail order houses have used size specifications for years, and publish scales giving size and measurement equivalents in their catalogs.

According to the new policy of the United Infants' and Children's Wear Association, manufacturers of infants' and children's dresses will tag their garments with chest and length measurements in addition to size by age. The new size tickets will carry four specific items—length, chest, size, and style number. In each instance, however, the tags will say "approximate measurements" when referring to the length and chest. This is intended to cover any possible error in manufacture, it was said.

Association Collects Data

Each manufacturer will file with the Association the measurements of his garments, and the information thus received from all manufacturers will be compiled. The Association will then be able to advise any member to what extent, if any, his measurements vary from that of the industry generally.

"This action does not mean that the Association has withdrawn from the ASA committee which is still conducting its study on standardizing sizes," Mr. Zuckerman said in announcing the new policy. "The fact is that the actual measurements—chest and length—recommended for

Association use come from the study on measurements developed by the American Standards Association and the Government's study."

Three recommendations as a basis for work on standard sizes were made by the ASA technical subcommittee. The recommendations, based on a study of statistics compiled by the U.S. Bureau of Home Economics from careful and detailed measurements of 147,000 children throughout the United States, are:

1. The combination of height and girth of hips [shown in the Bureau of Home Economics' figures to be the combination of sizes which gives the best indication of all the other dimensions of the child measured] is the best combination for developing a series of "Body Forms" to be used as a basis for the development of garment sizes.

2. A sufficient number of sizes should be chosen to cover the variations of the entire field.

3. Height and girth measurements and perhaps additional data should be included on labels.

The committee members have taken these recommendations to their organizations for study. Using the basic figures compiled by the Bureau of Home Economics from its measurements of actual children, 13 regular sizes and 26 auxiliary sizes have been suggested for boys; 12 regular and 24 auxiliary sizes for girls.

New ASTM Committee On Automotive Rubber

A technical committee to work on standards for automotive rubber products was organized recently by the American Society for Testing Materials, with L. A. Danse, metallurgist, Cadillac Motor Car Division, General Motors Corporation, as chairman. J. D. Morron, manager, Motor Products Division, U. S. Rubber Company, is secretary.

The present activities of the committee will be devoted to rubber used in motor mountings and similar articles. Data concerning the physical properties of rubber compounds now being supplied to the automotive industry to meet the various motor mounting specifications will be studied. Analysis of these data is expected to show whether some degree of standardization may already be in effect as a basis for the committee's work.

Another investigation will cover test methods now incorporated in motor mounting specifications to determine the significant differences in the tests used by various companies in evaluating the same property.

The new technical committee was organized at the suggestion of the Society of Automotive Engineers and will work under ASTM Committee D-11 on Rubber Products.

American Retail Federation Analyzes Consumer Movement

How the consumer movement looks from the retailers' point of view is the theme of the new booklet *Labeling the Consumer Movement*, just published by the American Retail Federation. Information about consumer objectives, organizations, and services has been collected, classified, and presented "to satisfy the retailer's curiosity, to answer questions about consumers, and to give him [the retailer] the basic facts on which he can form a judgment as to the position he should take in relation to this development."

"ACUCG Commands Respect"

A chronological analysis of the consumer movement, starting with the organization of the first consumer cooperative in 1830, and including the organization of the Advisory Committee for Ultimate Consumer Goods by the American Standards Association in 1936, answers the question "What is the Consumer Movement?" Charts show general, professional, religious, independent and educational organizations which are carrying on consumer programs, information and rating services, consumer cooperative associations, and consumer groups connected with government organizations, consumer groups financed by business, and testing, approval, and information services on consumer problems operated professionally or in the interests of business. One chapter outlines consumer activities of Federal, state, and local governments. Retailings' efforts to meet the demands of the consumer movement have a chapter to themselves, in which the activities of the National Consumer-Retailer Relations Council and the ASA Advisory Committee on Ultimate Consumer Goods are described. "The National Consumer-Retailer Council and the [ASA] Advisory Committee on Ultimate Consumers' Goods today are the business financed groups which command the respect and confidence of all the major consumer organizations," it says. "They present an agency for effective voluntary cooperation between consumers and business, to satisfy the demands of the consumer movement." A detailed analysis of the consumer cooperatives is given.

Labeling the Consumer Movement was prepared for the American Retail Federation through the efforts of many contributors under the supervision of Werner K. Gabler. It was undertaken, as explained by David R. Craig, the Federation's president, as one of the services needed to carry out its purpose "to provide accurate and comprehensive facts on major problems and movements which affect the retail business. The consumer movement comes within this scope."

New Manual Compiles Standards For Concrete Construction

To encourage the use of standards in the design and construction of reinforced concrete structures, the Concrete Reinforcing Steel Institute has just issued its *Manual of Standard Practice for Reinforced Concrete Construction.* Standard specifications of the American Society for Testing Materials, the American Concrete Institute, the Portland Cement Association, the Metal Lath Manufacturers Association, and the Concrete Reinforcing Steel Institute are given in the Manual.

"By standardizing methods of design, the selection of materials, the use and handling of materials, a degree of economy and quality of the finished structure has been developed that was unattainable under the old order of individual specialization," the Institute says.

A Quality Mark issued by the Institute to indicate that reinforcing bars comply with the standard specifications of the American Society for Testing Materials and are rolled from new billet steel is explained in one chapter.

Other material includes:

Complete text of ASTM standard specifications for billet steel, rail steel, axle steel, and a standard specification for 3,000 lb concrete
Specifications for placing reinforcement and for accessories and standard nomenclature
Standard details of design
General specifications for materials, mixing, and placing of concrete
Standard sizes of bars, spiral rods and tables of column spirals
Tables of allowable unit stresses, properties of sections, building code requirements, weights of materials, etc.
A code of standard practice for concrete joist construction
Design data load tables
Specifications for metal lath ceilings

Copies of the *Manual* are available from the Concrete Reinforcing Steel Institute, Builders Building, Chicago.

Commercial Standard Offers Tests For Oil Burner Furnaces

Minimum standard specifications and methods of test for home furnace oil burners, promulgated by the National Bureau of Standards as Commercial Standard CS75-39, have been accepted by industry and will be effective for new production from November 1, 1939. The Commercial Standard is expected to serve as a guide for manufacturers, distributors, installing contractors, and users. It covers manufacturing and production tests, and laboratory requirements and test procedure, as well as installation requirements and performance tests.

An Oil Burner Certificate is provided for burner installations. The certificate warrants that all equipment manufactured by the company selling the burner and bearing its name plate is free from defects in workmanship or material under normal use and service, and has been tested according to the Commercial Standard.

Laboratory service tests are provided by the standard to cover combustion performance, smoke determination, radio interference, and noise. Inspection and tests also provided by the standard cover interchangeability of all like parts on like models; reasonable freedom from vibration and undue wear; that motor and pump are securely mounted to assure proper alignment; that the motor cannot be loaded in excess of its rated capacity; and that ignition points of electrodes shall be made of heat-resistant material and securely fastened.

Mimeographed copies of the Commercial Standard for Mechanical Draft Oil Burners, CS75-39, may be obtained without charge from the Division of Trade Standards, National Bureau of Standards, Washington, D. C. Printed copies will be available later.

329 Cities Operate Under Uniform Building Code

There are now 329 cities operating under the direct or indirect influence of the Uniform Building Code, prepared by the Pacific Coast Building Officials Conference, according to *Building Standards Monthly*, August. One hundred sixty-eight cities operate under the Code in California, and 89 in other states. In addition, 68 cities in the United States, three in Canada, and one in Japan, are using codes based on the Uniform Building Code.

Management Association Booklets Show Importance of Standards

Two booklets comprising a series of articles on production problems in which standardization plays an important part are now available from the American Management Association.

The pamphlet on "Quality and Inventory Control," 75 cents, and "A Symposium on Unit Costs," $1.00, are available from the American Management Association, 330 West 42nd Street, New York.

Transit Industry's 36-Year Program Proves Value of Standardization

This article shows how the American Transit Association carries on its standardization program within its organization, as well as how it cooperates in the work of the American Standards Association

by

G. C. Hecker

General Secretary, American Transit Association

THE standardization work of the American Transit Association has been valuable to its membership in four distinct ways.

First, Through the development of standard construction specifications and "recommended practices" and the dissemination of this information to the industry construction and maintenance methods have been greatly improved, costs have been lowered, service interruptions and accidents due to improper construction have been reduced, and a high degree of uniformity in practice and construction has been established. This last is indirectly advantageous in that it permits more intelligent and efficient discussion of engineering problems with which transit companies are concerned.

Second, Standard material specifications and designs have facilitated ordering "to specification" and manufacturing on a production basis. This has brought about attendant economies; and has made possible substantial reductions in inventory by the simplification of sizes, dimensions, etc.

Third, Standards for construction, materials, and good practice, approved by the industry as a whole, have proved valuable to transit companies in court actions charging negligence, etc., as evidence that they have followed proper practice in construction or usage of material.

Fourth, The Association attaches considerable weight to its standardization activities and its committee work in general. This work is an important means of fostering good relations between the transit operating companies and the manufacturing companies supplying transit materials. These supply companies take an active part in Association committee work and cooperate very closely in working out satisfactory solutions of problems incident to transit operations and involving their materials and equipment. Moreover, when a standard is established through cooperative efforts of the user and supplier a high degree of conformity on both sides usually is obtained.

At the present time the Engineering Association is headed by an Executive Committee and carries on its committee work under three main divisions—Power, Rolling Stock, and Way and Structures—which follow the natural departmental division of engineering work within a transit company. The divisions are composed of a Standing Committee of 12 members and a number of special committees to which are assigned specific subjects for investigation. Most of the recommendations for the adoption of new standards or the revision of the existing ones originate in the special committees. When the membership of the special committee reaches agreement on the text of a new or a revised standard, it submits the material in a report with a recommendation for its adoption by the Association membership. This report must then be approved by the standing committee of the respective division. Following approval by both the standing and special committees, the report is submitted to the Executive Committee for final approval and authorization to distribute it to the Association membership.

When any report, including a recommendation

for the adoption of a new or revised standard, is sent out to the company membership, it must be accompanied by an official letter ballot by which the member companies can register their approval or disapproval of such recommendation. If this letter ballot results in affirmative action, the new or revised standard then is included in the ATEA Engineering Manual. This Manual is in loose-leaf form and revision sheets are issued annually.

All recommendations involving changes in the Engineering Manual must be approved by a two-thirds majority of the special committee, standing committee, and executive committee. In the final official letter ballot, the votes of the individual member companies are weighted according to the size of the company as measured by the annual dues paid to the Association, with a minimum of one vote for each company regardless of size.

If a recommendation involving a change in the Manual should fail to receive the required majority approval, at any stage of the action on it, the entire matter is referred back to the special committee for further consideration.

As additional assurance that the Engineering Manual will be kept up to date and in accord with the best modern practice, each standing committee of a division has the specific duty of reviewing all sections of the Manual coming within its jurisdiction once each year. If it is found that a minor revision of a Manual section is necessary, the standing committee may handle the matter within itself. If a major revision is indicated, it usually delegates the work to one of the special committees.

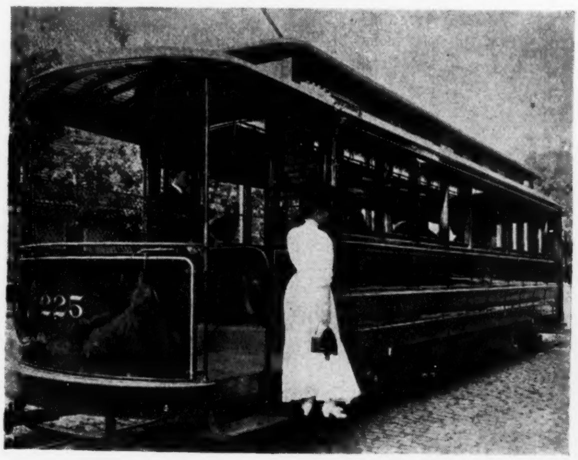
The Manual itself is made up of three divisions corresponding to the divisions of the Engineering Association committee work (Power, Rolling Stock, and Way and Structures). The scope of each of these divisions is indicated by its title. The Manual sections in each division are classified under the two grades of "Standards" and "Recommendations." These two types of sections are defined as follows:

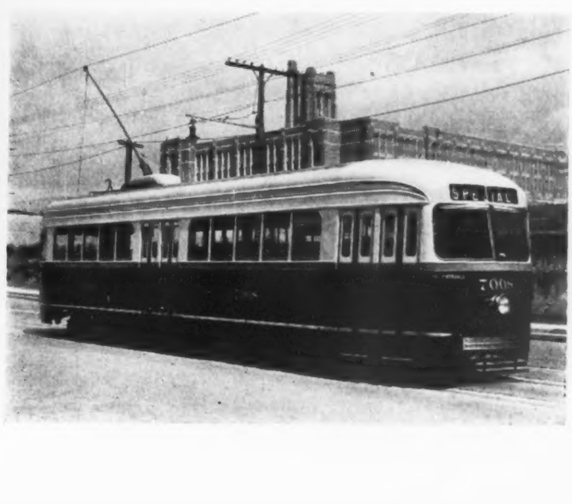
> **Standards shall be such standard articles, standard designs, standard specifications, standard units, standard terminology, standard measurements, or standard methods as are applicable to general use and represent the best practice.**
>
> **Recommendations shall be such recommended articles, recommended designs, recommended specifications, recommended units, recommended terminology, recommended measurements or recommended methods as represent good present practice or progress of the art but which, because of the formative state of the art and the likelihood of changes or which, although of value, do not permit adoption as standards at the time of the consideration.**

There is no definite rule requiring that material originally adopted as a "Recommendation" be advanced to the grade of "Standard" when the progress of the art justifies it but such action is usually taken in the natural course of events.

Cooperation With Other Organizations

Cooperative work with other national standardizing bodies is being carried on continually by the American Transit Association. This usually is done in one of two ways, either by the formation of a joint committee of the several groups involved or by the appointment of liaison representatives. This cooperative work may be either of a purely research nature or it may be for the development of a standard to be promulgated jointly by both associations. In many instances the standards of other associations for certain classes of materials have been adopted by the ATA for use by its members in recognition of the





When the American Transit Association started its standardization program trolley cars looked like this (1905). The trolley car of today is shown at the right

ACTIVE standardization work by the American Transit Association, on behalf of the transit and supply companies making up its membership, began in 1903 with the formation of a subsidiary organization of street railway mechanics, electricians, and Way Department employees under the title American Railway Mechanical and Electrical Association. The object of this affiliated association was the "acquisition of experimental, statistical, scientific, and practical knowledge relating to the construction, equipment, and operation of street and interurban railways."

In an address in 1903 before the parent body, at that time known as the American Street Railway Association, the first vice president said concerning the new affiliated organization:

> **"It is the purpose of this new organization to discuss mechanical and electrical subjects, exchange ideas on construction and equipment, and raise the standard of operation wherever improvement is possible. The necessity for better shop methods, and the advantages of correct and comprehensive records in the mechanical departments are now generally recognized and it will be the duty of the men forming the new organization to determine the best practice to be followed and see that it is adopted. It will be recognized, therefore, that the new Association has an important mission and is entitled to the support and cooperation of this, the parent organization."**

Since that time, a number of changes have been made in the title and organization of the parent body and its subsidiary groups. Today, in recognition of the fact that local transit is carried on with many types of vehicles (street cars, motor coaches, trolley buses, subway, elevated and interurban cars, and multiple-unit trains) the Association operates under the name of American Transit Association and the American Railways Mechanical and Electrical Association has become the American Transit Engineering Association.

The standardization activities of the Association continue to be centered in the Engineering Association, although certain standardization matters are being handled jointly with the ATA Bus Division. This Division was established as a subsidiary organization in 1935 to provide for activities relating specifically to all departments involved in the operation of motor coaches.

preeminence of that standard in its particular field, thereby helping to maintain simplification of standards.

Organizations other than the ASA with which the ATA is conducting or has conducted cooperative work include the following: American Society for Testing Materials; American Public Works Association; American Railway Engineering Association; American Road Builders' Association; Association of American Railroads; National Fire Protection Association; National Safety Council; Society of Automotive Engineers; American Institute of Electrical Engineers; American Wood Preservers' Association; National Bureau of Standards; Association of Edison Illuminating Companies; Insulated Power Cable Engineers' Association; Edison Electric Institute.

Relations With American Standards

The American Transit Association has been active in the affairs of the American Standards Association for practically the entire period of that organization's existence. It became one of the Member Bodies of the ASA in 1920. Originally it carried only a single membership. In 1926 a second membership was taken out. This second membership was dropped during the period of 1931 to 1935, for economy reasons. In the latter year, however, the second membership was renewed at the request of the newly-formed ATA Bus Division.

At the present time, the Association's representatives on the ASA Standards Council are: C.R. Harte of the Connecticut Company, and J.H.M. Andrews of the Philadelphia Rapid Transit Company. Their alternates are, respectively, E.M.T. Ryder of the Third Avenue Railway System and

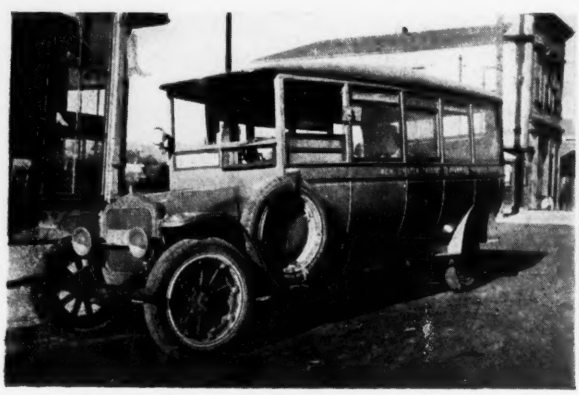
Fifteen years make a great difference in motor bus design. The bus shown above is modern 1939; the one on the opposite page is typical of 1924

R.H. Stier of the Philadelphia Rapid Transit Company. It may be of interest at this point to note that Mr. Harte has served as an ATA representative on the ASA Standards Council continuously since 1923.

The ATA is represented on the Electrical Standards Committee, the Mechanical Standards Committee, and the Highway Traffic Standards Committee, and has had a part in 69 different ASA projects, involving a total of 94 representatives and alternates. The Association is sponsor or co-sponsor for 12 ASA projects as follows:

- **C13** **Tubular Steel Poles for Electric Line Construction, Specification for**
- **C15** **750 Volt Direct Suspension Overhead Trolley Contact Construction, Specification for**
- **E2** **Design for Joint Plates for Seven-Inch Girder-Grooved and Guard Rails**
- **E3** **Design for Joint Plates for Nine-Inch Girder-Grooved and Guard Rails**
- **E4** **Design for Seven-Inch Girder-Grooved Rail**
- **E5** **Design for Nine-Inch Girder-Grooved Rail**
- **E6** **Design for Seven-Inch Girder-Guard Rail**
- **E7** **Design for Nine-Inch Girder-Guard Rail**
- **E8** **Seven-Inch, 82 lb Plain Girder Rail and Splice Bars for Use in Paved Streets**
- **E9** **Seven-Inch, 92 lb Plain Girder Rail and Splice Bars for Use in Paved Streets**
- **E10** **Special Trackwork Materials, Specifications for**
- **E11** **Seven-Inch, 102 lb Plain Girder Rail and Splice Bars for Use in Paved Streets**

The membership of this organization in the ASA is carried in the name of the parent Association, the American Transit Association. Authority to act, however, on all matters relating to the American Standards Association, except final action on financial questions and similar matters of policy, was delegated originally to the Engineering Association. Following the organization of the Association's Bus Division, it assumed responsibility for ATA interests in certain projects directly affecting motor coach operation. Under this arrangement, all appointments of ATA representatives on ASA sectional committees are handled by the president of the American Transit



C. R. Harte
Chairman of ASA Electrical Standards Committee; ATA representative on ASA Standards Council since 1923

Its four representatives and alternate representatives on the Standards Council of the American Standards Association give the American Transit Association a voice in all decisions on approval of American Standards, initiation of work on standards, and membership of ASA technical committees. In addition, the ATA is represented on three of the industry coordinating committees which have responsibility for standardization work in special fields—the Mechanical Standards Committee, the Electrical Standards Committee and the Highway Traffic Standards Committee. It is also represented on the United States National Committee of the International Electrotechnical Commission, which carries on its work under the American Standards Association.

The ATA also has a part in the actual technical work of the American Standards Association, with representatives working on 54 ASA committees. Twelve of these committees are under the administrative leadership of the American Transit Association.

Engineering Association or by the chairman of the Bus Division as the case may be.

It is the general policy of the Association to allow its representatives on sectional committees complete freedom to act on behalf of the Association on any questions that may come up in the sectional committee proceedings. Such representatives are advised, however, that whenever there may be any doubt in their minds concerning the proper action to take in any matter, they shall consult with the proper officers, division, or committee of the Association before proceeding. This same policy applies to the ATA representatives on the Standards Council, Electrical Standards Committee, Mechanical Standards Committee, and Highway Traffic Standards Committee.

All ATA representatives on sectional and other ASA committees are asked annually for a report on the status of the work in progress. A summary of these reports is made up and transmitted to the Executive Committees of the Engineering Association and the Bus Division for the information of these bodies and to facilitate discussion of any questions raised. During the interim between these annual reports the Association headquarters staff follows all new developments in ASA activities as brought out in ASA releases, announcements in INDUSTRIAL STANDARDIZATION and in correspondence with the individual ASA representatives. Any matters considered to require discussion or action are brought before the Executive Committee at their next regular meeting, or by correspondence if action is required in advance of the next meeting.

With respect to the matter of sponsorship for ASA projects, the procedure of the ATEA provides that if the American Transit Association is designated as sponsor for an ASA project and ultimately a standard is prepared for adoption through that project, such standard shall not be submitted to the ASA for adoption as an American Standard until it has passed through the standardization procedure of the ATA and has been regularly approved by the ATA membership. This procedure is considered advisable on the ground that if the ATA has sufficient interest in a project to accept sponsorship for it, it should be determined by an actual vote of its membership whether or not the finished product is acceptable from their standpoint before proceeding further with the adoption by the ASA membership.

Statistics to Help Prevent Accidents in Coal Mines

AS a first step in an international effort to better working conditions and to help prevent the 5,000 deaths and 400,000 injuries in coal mines each year, the International Labor Office[1] has just issued a survey of the causes of underground accidents in the coal mines of some of the principal coal-producing countries, and of law and practice in coal-mining safety.

The survey was prepared to serve as a basis for preparation of a model code of safety regulations for underground work in coal mines scheduled for consideration at a conference on Underground Safety in Coal Mines at Geneva, Switzerland, in October, 1939.

This survey is the first attempt ever made to provide a systematic and complete comparison of the safety regulations of the chief coal-producing countries.

The countries whose mining regulations have been analyzed are Belgium, France, Germany, Great Britain, Netherlands, South Africa, USSR, and USA.

[1]The International Labor Office is an agency of the League of Nations, and has its headquarters in Geneva, Switzerland. Cyril Ainsworth, assistant secretary of the American Standards Association, is one of the three United States members.

The five chapters in the book cover:

- **Accident statistics**
- **Important safety provisions of the mining laws and regulations of the countries concerned, in analytical form**
- **Inspection**
- **An account of safety work carried out on a national scale by Government departments, research institutions, safety associations**
- **Descriptions of one or two examples of safety organizations in individual mines**

To facilitate comparison the material in this chapter on laws and regulations has been grouped by subject in 23 sections, among the most important of which are those on shotfiring, supports, haulage of material, travel of workers, winding, ventilation, precautions against firedamp, precautions against coal dust, and electricity.

Other sections deal with means of access and egress, explosives, lighting, mine fires, shaft sinking, first aid, and rescue.

Copies of Volume 1 on National Legislation of "Safety Provisions for Underground Work in Coal Mines" may be purchased from the International Labor Office, 734 Jackson Place, Washington, D. C., at $2.00 each.

NFPA Committees Report Progress on Standards

MORE than 30 technical committees presented reports of their activities at the Annual Meeting of the National Fire Protection Association at Chicago May 8 to 12, according to the Proceedings of the Forty-Third Annual Meeting just published by the NFPA as Part 2 of its Quarterly for July, 1939. Several of these reports are of special interest to members of the American Standards Association:

The Electrical Committee, also a sectional committee under the precedure of the American Standards Association, reported that its new program for revising the National Electrical Code at three-year intervals is making satisfactory progress. Under this new program, recommended changes in the 1937 Code have been prepared and are being circulated to members of the Electrical Committee. The committee will meet in November to consider the proposed changes. The recommendations of the committee will then be circulated in time to give members of the NFPA an opportunity to consider them before the next Annual Meeting scheduled for May, 1940. Under this arrangement, a year elaspes between the time that subcommittees submit their recommendations and final action is taken by the NFPA. This, the report of the committee points out, is a considerable change from the former procedure which allowed only two months consideration of the committee's recommendations before action by the NFPA. It is expected that the next edition of the National Electrical Code, last approved by the ASA in 1937, will be submitted for approval about September, 1940.

The Committee on Dust Explosion Hazards which is also the ASA Committee on Safety Codes for the Prevention of Dust Explosions (Z12) presented two codes for adoption by the NFPA. One was a safety code for the Prevention of Dust Explosions in the Manufacture of Aluminum Bronze Powder; and the second, which was presented for tentative adoption, is a safety code for the Prevention of Sulphur Dust Explosions and Fires. Both were unanimously adopted by the NFPA Annual Meeting. Steps are being taken to submit the first of these two codes to the American Standards Association for final approval.

This committee is working on new codes for the prevention of dust explosions in country grain elevators and in drug and insecticide plants.

In comparison with the ten-year period from 1919 to 1928, the ten-year period from 1929 to 1938, inclusive, showed a total reduction in losses from dust explosions of more than $8,000,000, David J. Price, chairman of the committee, reports. This reduction in loss he traces directly to the adoption of the safety codes prepared by this committee and to compliance with their requirements. New industries are raising new problems, however, and in many cases research work must be carried on to determine the explosive characteristics of the new products, he declares. New manufacturing processes may also introduce new combinations of dusts, gases, and solvents for which additional information will be necessary to provide proper protection.

The economic importance of the work being done by this committee is shown in the record of the losses which the codes are designed to prevent. Some 400 dust explosions have occurred in industrial plants in the United States in the last 20 years, Mr. Price reports, more than 300 persons have been killed, nearly 700 others injured, and the property loss in insurance paid has amounted to more than $28,000,000. The loss from dust fires and explosions in country grain-handling plants in all the grain-producing states has been estimated as approximately $3,000,000 annually.

The Safety to Life Committee (also the ASA Building Exits Code Committee) recommended revisions to the Building Exits Code, to provide that electrical installations for lighting and signs shall be in accordance with the National Electrical Code, and to provide for safe single exits in two-story and three-story hotels and apartment houses. For some time, the discussion in the meeting indicated, governmental agencies interested in construction of multiple dwellings have found difficulty not only in planning such dwellings but also in meeting economic problems brought about in complying with the Code requirements for two separate exits. The NFPA voted unanimously to accept the amendments for lighting and for a single exit for two-story buildings, but the provision for a single exit for three-story buildings was returned to the committee for further study.

The Committee on Hydrants, Valves, and

Pipe Fittings reported that progress is being made in bringing the hydrant specifications of the American Water Works Association and the NFPA into agreement.

The Committee on Regulations for the Installation of Open and Automatic Sprinkler Equipment reported a complete revision of the edition of 1936. The recommendations will be given further study, and the revised regulations will probably be offered for adoption next year.

The Committee on Blower Systems proposed amendments in the regulations for installation of air conditioning, warm-air heating or cooling, and ventilating systems (revisions to American Standard Z33.2-1938). These revisions were adopted by the NFPA and have now been approved by the American Standards Association.

"Trying to Eliminate Bottlenecks" Says *Time* of ASA

"At such times as the present, orders can be delivered no faster than the economic assembly line is able to move through U.S. industry's many tight spots and bottlenecks," says *Time*, October 2. "The necessity of using obsolete equipment raises costs, prices begin to pyramid, and panicked customers over-buy. . . . For this among other reasons many a businessman last week had his fingers crossed about a war boom. One of U.S. industry's most influential spokesmen, President Howard Coonley of National Association of Manufacturers (also chairman of the Advisory Committee of American Standards Association, which is trying to eliminate bottlenecks by promoting standardization) took time out to broadcast: '. . . We have no illusions . . . Economic chaos and years of crushing depression are [war's] inevitable aftermath . . . ultimately, no one can escape the ruin of war.' "

Scope of ASA Committee Activities Broadened by Council Action

The scope of activities of several of the standardization projects of the American Standards Association was broadened by action of the ASA Standards Council recently.

The work of the committee on the Safety Code for Window Cleaning will now include provisions for window washing in industrial buildings as well as office buildings and mercantile establishments.

The activities of the committee on the Safety Code for Woodworking Plants has been expanded to include cooperage and veneering operations which had not been included previously, and the scope of the project on Safety Code for Industrial Sanitation now includes mercantile establishments, as well as industrial plants, construction operations and temporary labor camps.

Franklin H. Wentworth, who has been secretary-treasurer and managing director of the National Fire Protection Association for 30 years, resigned his administrative duties at the Association's annual meeting. To succeed Mr. Wentworth, Percy Bugbee, formerly assistant managing director, has been elected general manager. Mr. Wentworth will continue his connection with NFPA work as consultant on several phases of the Association's program.

Officers of the Association for the coming year are:

Samuel D. McComb, *President*
Alvah Small, *Vice-president*
David J. Price, *Vice-president*
Hovey T. Freeman, *Secretary-Treasurer*
Albert T. Bell, *Chairman of the Board of Directors*

The National Fire Protection Association is active in the work of the American Standards Association, acting as sponsor for seven ASA committees, and being represented on 16 others. It is also a member of the Building Code Correlating Committee and the Safety Code Correlating Committee. With the Associated Factory Mutual Fire Insurance Companies, the National Board of Fire Underwriters, and the Underwriters' Laboratories, the National Fire Protection Association completes the group of four national organizations which make up the ASA Fire Protection Group. This Group is represented on the ASA Standards Council which makes final decisions on standardization questions before the ASA. Alvah Small, vice-president of the NFPA, is the nominee of the Fire Protection Group on the ASA Board of Directors.

How Preferred Numbers Can Be Applied In a Standardization Program

Size problems in design of manufactured products are simplified, and expense is saved, when designers use Preferred Numbers wherever possible

by
H. W. Tenney

Manager, Engineering Laboratories and Standards Department, Westinghouse Electric and Manufacturing Company

SIZE problems play an important part in one way or another in all manufactured articles—in fact, in all articles of commerce. The sizes used in industry and commerce presenting different types of problems to the designer, may be classified into several different categories or classes, according to C. H. Hirshfeld and C. H. Berry[1] of the Detroit Edison Company, as follows:

1. **Sizes which are entirely matters of style, such as the lengths of coats, the heights of hats, and other dimensions which change from year to year.**
2. **Sizes which are determined entirely by personal comfort, such as the sizes of men's collars, the sizes of hats, shoes, etc. Each of these series of sizes has been worked out by experience.**
3. **Sizes which are entirely matters of taste, although not necessarily matters of fashion, typified in the proportions of a Doric column entering into a structure. These proportions are not determined by strength but by appearance. Proportions of sizes of furniture, objects of art, and many architectural features fall in this class.**
4. **Sizes which are determined by combination of appearance and utility, illustrated by buttons on a coat, drawer pulls, door knobs, etc.**
5. **Sizes which are determined entirely by utility or use value, for example, such items as materials or innumerable machine parts.**
6. **Sizes which are influenced or controlled by natural formations, as, for instance, coal-mining equipment. Dimensions are governed by the height and width of coal seams.**
7. **Sizes which are governed by interdependent conditions, such as clearances, size of freight cars, railroad clearances, harbor facilities, etc. All may influence the design of apparatus.**

Sizes falling under the first classification are by nature arbitrary and changeable and hardly lend themselves to any sort of standardization.

Although the sizes in classes 2, 3, and 4 might wholly or in part be brought within the scope of the application of preferred numbers, the development of the esthetic sense in the case of art objects, or general acceptance over a long period of time, in the designation of shoe sizes, for example, offer considerable resistance to upsetting this habit pattern in our lives.

Sizes which fall in Class 5 are those with which we are more generally concerned in industry, both as manufacturers and consumers.

Before the advent of Preferred Numbers there was much that was arbitrary in the choice of size, even when size was determined by utility or use. Careful study shows that some variations in the sizes selected would not have made a great difference in the use value and the selection of sizes would have been placed upon a more systematic basis. Who can say that a selection of 9, 11,

[1]In their paper "Size Standardization by Preferred Numbers," presented before the American Society of Mechanical Engineers in 1922.

Six tables of basic preferred numbers, in both decimal and fractional series, are given in the American Standard Preferred Numbers (Z17.1-1936). They may be used for linear dimensions, such as diameters and lengths, and for areas, volumes, weights, and capacities; for ratings of machinery and apparatus; and for characteristic ratios of figures for all kinds of units. Copies of the standard are available from the American Standards Association at 25 cents each.

13, and 15 quart sizes for pails would not have been as satisfactory as those generally used, of 8, 10, 12, and 14 quart sizes. After a little reflection we begin to realize that certain numerical values are universally accepted as preferred values, and if they are so spaced and are of such extent as to fit in with all the requirements met in deciding on sizes to be used the arbitrary choices may be so made as to yield sizes expressible in terms of these preferred numbers.

One who has not studied the development of Preferred Numbers may have the impression that the Preferred Number System is something which has been developed within the past few years. One of the early applications of Preferred Numbers was in the American Wire gage (Brown and Sharpe Gage) in 1857. This system follows one of the Preferred Number series quite closely. Unfortunately this was an isolated application and was not followed in the development of other gage systems brought out subsequently. Consequently the overall picture of systems of gages in use in this country today is chaotic.

Preferred Numbers in 1870

Another early application of Preferred Numbers was made in the 1870's by Colonel Charles Renard, in charge of the Aeronautical Section of the French Army. He found that 425 different cables were being used for the simple purpose of mooring captive balloons. This appeared to be an excessive variety and Colonel Renard started to analyze this problem. As a result, he developed a general theory applicable to all cases of a similar nature. He reduced the number of cables to 17, the diameters of which (a measure of their strength) were based on Preferred Numbers. Since that time the French have called this system the Renard Series. It is interesting to note that the series which Colonel Renard developed is one of those which makes up our Preferred Number System of today.

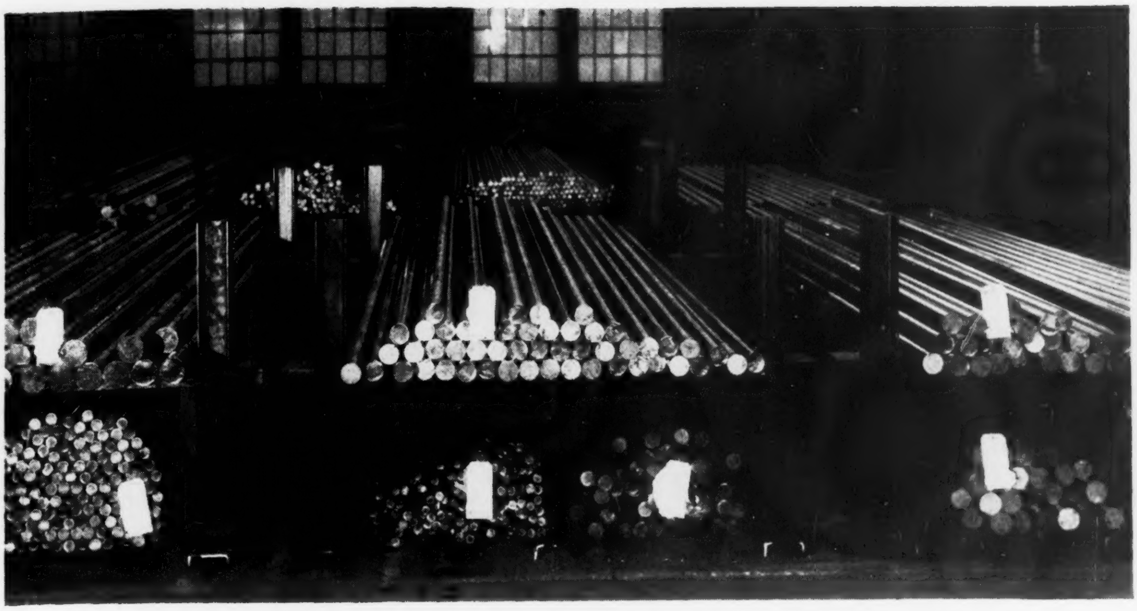
We might reflect at this point that one of the greatest destructive agents to civilization has been one of the greatest forces for standardization. That is warfare. In the earliest records that are available, we find that the development of the arts of war necessitated specialization of function and standardization of separate units, such as cavalry, infantry, archery, and later artillery, ordnance, hospital, commissariat, etc. These units, in turn, necessitated a set of formal procedures, called tactics, for given strategic situations in coping with the enemy. The bas reliefs on Egyptian temples and monuments show not only standardized military action and worship, but also standardized bows and arrows and a standard complement of equipment carried by each soldier.

Based on European Experience

After Colonel Renard's development of a Preferred Number series, we hear very little about this phase of standardization until sometime in 1918. At this time Dr. Rudenberg of Germany became interested in the development of some systematic series of numbers as a basis for standardization, more or less as a hobby. The early work indicated that probably the most satisfactory system would be one in which each succeeding number was a fixed percentage larger than the preceding number. It was, however, recognized that if the practice developed of indiscriminately selecting a separate series for different applications, the natural consequence would be a great number of series in which different percentage figures would be used. Such a course would largely defeat the general purpose of standardization. The Preferred Number System, as we know it today, is the result of mature deliberation and is based on the result of experience in Europe.

While the system of Preferred Numbers is in itself so very simple, it was shrouded with considerable mystery by many mathematical discussions and this alone impeded the extensive use of it. The reason the engineering profession as a whole did not for a time take more interest in the system was that its utter simplicity was not sufficiently advertised.

Just what are Preferred Numbers? Normally, in the range of 10 to 100 we have 90 integral numbers to choose from. If one-eighth fractions are considered, however, we have 720 numbers. With such a wide variety to choose from there is little tendency toward standardization. Therefore, certain numbers, called Preferred Numbers, have been adopted with the idea of furthering stand-



Cold finished steel bars are stocked by Westinghouse, following the fractional series of Preferred Numbers. Sizes up to 1⅜ in. diameter conform to 20 series and above 1⅜ in. conform to 40 series

ardization, by offering fewer numbers to choose from. The various national and international committees entrusted with the selection of these numbers have endeavored to provide logical series of numbers. The basis on which these series have been developed has been that each number in a series differs from the preceding number by a definite percentage. The adoption of several related series permits of a greater or lesser number of steps for a given range of numbers. As a result of much study it was decided that the series should be based on roots of 10. This is a fortunate choice because the series starts with 10 and ends with 100. Any series may be projected to the range above 100, by multiplying the steps between 10 and 100 by 10, 100, etc., and likewise, by dividing the steps by 10, 100, etc., Preferred Number series below 10 can be formed.

It is, of course, possible to develop a great many geometric series between 10 and 100. However, by careful selection of the fractional exponents, a group of related series has been selected to be used for standardization purposes. The series which have been approved by the American Standards Association for the proposed international systems are the 5, 10, 20, and 40 series. The so-called 5 series is based on the fifth root of 10 and provides five steps between 10 and 100, in which each succeeding step is 60 per cent greater than the preceding step. Similarly the 10 series provides ten steps, 25 per cent apart; the 20 series provides twenty steps, 12 per cent apart; and the 40 series provides forty steps, 6 per cent apart. Supplementary series, having steps increasing by different percentages can be obtained by taking every other number or every third number in one of the basic series.

Preferred Numbers should be used because they form the very basis of standardization. When new articles are to be manufactured, it is usually impossible to delay action until national standardization can be brought about. If, therefore, the individual manufacturers proceed with Preferred Numbers as the basis of their work, the chances are that the standards of the various manufacturers will already coincide to a great extent, if not completely, when later on national standardization is attempted. At times the use of these numbers will naturally result in national standardization without any further time-consuming and costly committee activities.

Standards for Interrelated Parts

Not only will standardization of certain articles come about through the use of this system, but also standardization of tools and many other interrelated parts or articles will follow. In cases where national standardization may never be involved, similar advantages will accrue from their use because it will tend toward standardization within an individual company, through automatic

coordination of the work of different departments or individuals. Even with successive designs brought out by the same individual, adherence to the use of Preferred Numbers will have the advantage of counteracting the use of too many or irregular steps in a line, or unnecessary differences between such successive designs. There is quite frequently an urge in practice for small and irregular steps or sizes because of some temporary advantage which can be secured either from a design or commercial point of view. However, such temporary advantages are afterwards nearly always paid for rather dearly by the expense and complications caused by additional tools, stock, spare parts, etc., all of which will be avoided or minimized if the designers will cultivate a habit always to think in terms of standardization by Preferred Numbers. Finally, the fact that these numbers represent a geometric series facilitates many calculations, and eliminates a repetition of complicated calculations, because many results will bear the proper relation to one another in a line of devices based on these numbers.

Select Best Number

With tables of Preferred Numbers available, it is merely a question of selecting from them the most advantageous number for any intended purpose, keeping in mind that in general a number from the 5 series is preferable to one from the 10 series, a number from the 10 series is preferable to one from the 20 series, etc. It is hard to imagine anything simpler.

Let us assume, for instance, that the width of a square-top card table is to be selected. It is known from experience that a size somewhat over 30 inches is convenient for this purpose. By reference to the table, it is at once evident that in this case a width of 32 inches, taken from the 10 series, should be selected, because the nearest numbers shown in the 5 series, namely, 25 and 40, would not be practical in this particular case. With reference to the heights of the table, it is known that a convenient dimension is between 27 and 29 inches. In this case the nearest numbers (25 or 40) in the 5 series, as well as the nearest numbers (25 or 32) in the 10 series, would naturally interfere with convenience, and common sense therefore dictates the choice of 28 from the 20 series for the height. There is no question that the standardization of the dimensions mentioned is highly desirable, because frequently a number of card tables are joined for use when a luncheon is served, which obviously makes it desirable to have both the width and the height of all tables alike.

The example given relates to the choice of a single number for a definite purpose, the selection in all cases being governed by convenience or utility. In other cases a series of several numbers may have to be selected for the standardization of a line of devices or apparatus, a typical example of this being the horsepower ratings of a line of electric motors. When electric motors were first developed, and for many years thereafter, there were no recognized Preferred Numbers and, as a consequence, the independent choice of ratings by the different manufacturers led to a chaotic condition. For example, one manufacturer selected standard ratings of 20, 25, 35, 50, and 75 horsepower; another selected 20, 25, 30, 50, 60, and 75 horsepower. Very soon, however, the manufacturer not having a 30 horsepower motor found that he was handicapped whenever a customer called for that rating, and in order to meet the situation he designed a 30 horsepower motor, which, of course, was out of line with his standards. Before long it came about that customers not only expected to obtain any one or both of the previously mentioned series of ratings, but they also demanded odd ratings not contained in either of the above series, such as 35, 45, 55 or 65 horsepower.

All of this, of course, meant economic waste for which the users had to pay in the long run, and a real standardization and elimination of such waste was not accomplished until 20 or 30 years after the advent of the electric motor. Similar examples of chaotic conditions could be cited for practically every type of apparatus, such as generators, transformers, controllers, contactors, etc. In some of the latter examples standardization was delayed even longer than in the case of motors.

It is difficult to avoid such conditions, because in a new industry it will naturally take some time before trade associations or other bodies can be properly organized and subsequently reach an agreement. Assuming, however, that in the early stages of a new industry a system of preferred numbers was available and in general use, certain standards in the industry could be established long before standardization by the interested associations would be feasible. With the motor ratings referred to above, it would have been quite easy for any of the individual manufacturers to have started out with ratings 20, 25, 32, 40, 50, 63, and 80 horsepower, corresponding to the 10 series.

Industry Neglects Use

Unfortunately, however, even today, when Preferred Numbers are available, industry is not taking advantage of them to any great extent. Reference might be made to one of the more recent industries, namely, refrigerators, which are rated according to their cubic contents. Following are

the standard ratings of one manufacturer for three years:

1931	*1932*	*1933*
2.7	2.6	
4.3	4.2	4.2
	6.1	6.2
7.3	7.2	7.5
9	9	9.3
	13.5	15.3
	30.1	21.8

also a comparison of the ratings of two different manufacturers during the same period:

4.4	4.2
6.3	6
6.7	7.2
9	9
10.9	11
11.3	
13.6	13.5
14.8	
17.2	
18	
18.3	20.1

It will be found that even in the simple cases discussed so far, conditions will arise which will make it at times difficult to adhere strictly to the use of these numbers. To illustrate this, let us assume that a Preferred Number has originally been chosen for the overall width of a refrigerator. Certain improvements in the heat-insulation material of the box may subsequently make it possible to reduce the wall thickness. In order to take advantage of this, either the dimensions of the food liner or the outside dimensions of the refrigerator will have to be changed. It may be found relatively inexpensive to change the outside dimensions, while a change in the dimension of the food lining cabinet may mean expensive and therefore undesirable tool changes. In such a case, it may be common sense, at least for the time being, to make the outside width of the box less than the Preferred Number. This would not result in any practical disadvantage, as the refrigerator could still be placed within the space provided for it. On the other hand, exceeding the Preferred Number dimension should obviously be avoided. Cases of this kind often arise in practice with any standardization and each case has to be considered on its own merits.

Possible application of Preferred Numbers as simple as those mentioned are numerous and a great deal could be accomplished even if Preferred Numbers were used only for such simple cases. There are, of course, also conditions where more or less complex interrelations of ratings or dimensions exist, making the application of Preferred Numbers somewhat more difficult. However, even then a solution can usually be worked out if common sense is used and the economical phases of the problem kept in mind.

Stripped of all mystery and of mathematical formulas and expressions, Preferred Numbers are simply groups of certain numbers which should be used in preference to any others whenever a standardization of ratings, dimensions, or what not is desirable.

British Standards Institution Expands Activities

Activities of the British Standards Institution have been expanded during the past six months through the organization of four new Industry Committees and 25 new technical committees. The new Industry Committees—for the glass industry, paper industry, timber industry, and cement, lime, and concrete industry—were formed to coordinate and supervise standardization activities in their particular industries.

The new technical committees deal with a wide range of projects, including personal safety equipment; jewels and pivots for instruments; chimneys for domestic and industrial purposes; sizes, designation and packing of films; magnetos for internal combustion engines; glasses for welders; methods of wood preservation; anti-static and conductive rubber; trailing cables for quarries.

The British Standards Institution now has 21 Industry Committees and more than 960 technical committees and subcommittees.

Research Leads to Specifications For Railroad Signal Glassware

The National Bureau of Standards has cooperated with the Association of American Railroads, Signal Section, and the Corning Glass Works, in extensive measurements which have led to new purchase specifications for glassware for signals. The new specifications are known as Association of American Railroads (AAR) Signal Section Specifications 59-38 and 69-38 for lantern glassware and for pressware, disks, and slides.

An article in the June number of the *Journal of Research* of the National Bureau of Standards by K. S. Gibson and Geraldine W. Haupt is the first of a series describing this investigation. The paper gives the spectral transmissions of the basic standards—red, yellow, green, blue, purple, and lunar white glasses—on which the AAR scale of transmission is based. Future papers will deal with the measurement and specification of the glasses selected to define the limits of permissible color when used with specified illuminants.

Australian Industry Develops Testing, Gaging Standards

Australian industry recently started a program of expansion in precision standards, testing, and certification, as part of its rapid independent development and its new program of munitions making. In connection with the development of Australian industry the July *Bulletin* of the Standards Association of Australia says:

"In a world in which mass production and precision manufacture are rapidly becoming commonplace, Australia is ceasing to be merely Britain's market garden and is beginning to foresee the achievement of her destiny through a balanced industry. . . .

"Of fundamental importance is the creation of a National Reference Standards Laboratory, the building of which in the grounds of Sydney University, by the Council for Scientific and Industrial Research, is to be expedited with a view to having it in operation by the middle of 1940. Closely allied to this will be the service of gaging, testing, and certifying, which is the channel through which the national standards will bring precision and certitude to the production shop. Already several States are making plans for the coordination of testing services and the provision of sub-standards and gaging equipment. With the assistance of the Commonwealth Government, South Australia is to establish a modern gage and tool factory. Instrument manufacture in Australia is being discussed. Annexes are being established in existing workshops in several States for the manufacture of munitions, and this involves the introduction, where not already installed, of an accurate and certified measuring and gaging equipment.

"Finally, the British Standards Institution is cooperating in the British drive for accelerated production in the precision field by preparing a series of standards for Engineers' Precision Measuring Tools."—*Bulletin of the Standards Association of Australia, July.*

McBryde Named President By Mechanical Engineers

Warren H. McBryde, consulting engineer, San Francisco, is the new president of the American Society of Mechanical Engineers, C. E. Davies, ASME secretary, announced September 26.

Vice-presidents of the ASME for the coming year are: Kenneth W. Condit, The Conference Board, New York; Francis Hodgkinson, honorary professor of mechanical engineering, Columbia University; J. C. Hunsaker, head of the department of mechanical engineering, Massachusetts Institute of Technology; and K. M. Irwin, Philadelphia Electric Company.

The American Society of Mechanical Engineers was one of the founder societies of the American Standards Association, and is now an ASA Member Body, with a voice in determining the policies of the ASA. The ASME has representatives on the ASA Standards Council, and a member on the Board of Directors. Three of the new ASA vice-presidents have had close contact with the work of the ASA, Mr. Hodgkinson as a member of the United States National Committee of the International Electrotechnical Commission, which works through the American Standards Association; Mr. Condit and Mr. Irwin as members of ASA technical committees.

Patent Decision Protects Use of IES Mark

The mark "IES" on lamps manufactured to the standard specifications of the Illuminating Engineering Society will have no competition from a similar trade mark "ILS," Hon. Leslie Frazer, Assistant Commissioner of Patents, decided June 23. The Seelig Specialties Company of New Orleans, La., had attempted to register the mark "ILS" for "portable electric lamps, such as so-called floor lamps," to which the IES filed an Opposition Proceeding.

The Assistant Commissioner in his decision said:

"That the two marks, used in connection with identical merchandise, are so similar as to be likely to confuse the public and to deceive purchasers seems clear beyond argument. . . ."

British Association Issues Draft Standards

Drafts of proposed British Standards which have recently been received by the American Standards Association are as follows:

- **Artificial Daylight Fittings for Colour Matching CF (ELG) 2751 (Comments before January 20)**
- **9 M1 Automatic Pipette CF (C) 3403 (Comments before January 27)**
- **Ships' Side Scuttles CF (ME) 3469 (Revision of BS 3024-1926) (Comments before February 3)**
- **Brass Tubes, Tubes for Screwed Glands, and Screwed Glands for Condensers (Combining Nos. 378-1930 & 3000-1921) CF (NF) 3512 (Comments before February 10)**

The final date on which comments may be received by the British Standards Institution is shown following its title above. The American Standards Association will be glad to forward any comments to the BSI. Copies of the drafts may be borrowed from the ASA office.

ASA Standard Activities

Each month this space will be assigned to the listing of new projects, new standards, drafts of standards submitted to the American Standards Association for approval, or drafts not yet submitted but which are now being considered by ASA committees.

Standards Approved Since Publication of Our September Issue

(The large number of standards approved and under consideration makes it impossible to list in this issue all the standards approved since the last Indexed List of Standards, February 1. The September issue lists all standards approved from February 1 up to the publication of that issue.

(Where price is not shown below, copies of standards were not available at time of publication. Orders will be received by the ASA and filled when copies become available.)

American Standard Specifications for Gypsum Plasters (Revision of A49.3-1933) A49.3-1939

American Standard Specifications for Billet-Steel Concrete Reinforcement Bars (Revision of A50.1-1936) A50.1-1939

American Standard Specifications for Alloy-Steel Bolting Material for High-Temperature Service (Revision of G17.2-1934) G17.2-1939

American Standard Specifications for Forged or Rolled Steel Pipe Flanges for High-Temperature Service (Revision of G17.3-1936) G17.3-1939

American Standard Specifications for Mild Steel Plates (Revision of G20-1936) G20-1939

American Standard Specifications for Structural Rivet Steel (Revision of G21-1938) G21-1939

American Standard Specifications for Uncoated Wrought-Iron Sheets (Revision of G23-1937) G23-1939

American Standard Specifications for Steel for Bridges and Buildings G24-1939

American Tentative Standard Specifications for Copper Base-Alloy Forging Rods, Bars, and Shapes (Revision of H7-1925) H7-1939

American Standard General Methods of Testing Woven Textile Fabrics (Revision of L5-1938) L5-1939

American Standard Specifications for Timber Piles 06-1939

American Standard Specifications for Structural Wood Joist and Plank, Beams and Stringers, and Posts and Timbers 07-1939

American Standard Method of Test for Cloud and Pour Points (Revision of Z11.5-1935) Z11.5-1939

American Standard Method of Test for Distillation of Natural Gasoline (Revision of Z11.11-1932) Z11.11-1939

American Standard Method of Test for Sulfur in Petroleum Oils by Bomb Method (Revision of Z11.13-1934) Z11.13-1939

American Standard Method of Test for Thermal Value of Fuel Oil (Revision of Z11.14-1928) Z11.14-1939

American Standard Method of Test for Burning Quality of Kerosene Oils (Revision of Z11.17-1936) Z11.17-1939

American Standard Method of Test for Carbon Residue of Petroleum Products (Conradson Carbon Residue) (Revision of Z11.25-1936) Z11.25-1939

American Standard Definitions of Terms Relating to Petroleum (Advancement to standard of tentative standard Z11.28-1936) Z11.28-1939

American Standard Method of Test for Gravity of Petroleum and Petroleum Products by Means of the Hydrometer (Revision of Z11.31-1936) Z11.31-1939

American Standard Method of Test for Knock Characteristics of Motor Fuels (Advancement to standard of tentative standard Z11.37-1938) Z11.37-1939

American Standard Viscosity-Temperature Charts for Liquid Petroleum Products (Advancement to standard of tentative standard Z11.39-1937) Z11.39-1939

American Tentative Standard Method of Test for Color of Lubricating Oils (Revision of Z11.34-1935) Z11.34-1939

Standards Now Being Considered by Standards Council for ASA Approval

Taps, Cut and Ground Thread (Revision of B5.4-1930)

Involute Splines—Side Bearing B5.15

Round Unslotted Head Bolts (Revision of B18.5-1928)

Welded Wrought-Iron Pipe (Revision of B36.2-1939; ASTM A 72-38)

Lap-Welded and Seamless Steel Pipe for High-Temperature Service (Revision of B36.3-1936; ASTM A 106-36)

Electric-Fusion-Welded Steel Pipe (Sizes 30 in. and over) (Revision of B36.4-1936; ASTM A 134-36)

Electric-Fusion-Welded Steel Pipe (Sizes 8 in. to but not including 30 in.) (Revision of B36.9-1936; ASTM A 139-36)

Routine Analysis of White Pigments (Revision of K15-1933; ASTM D34-33)

Methods of Test for Specific Gravity of Pigments (Revision of K41-1937; ASTM D 153-27)

Definitions for Varieties of Bituminous and Sub-bituminous Coals M20.4

Safety Code for the Prevention of Dust Explosions in the Manufacture of Aluminum Bronze Powder

Proposed American Recommended Practice for the Use of Explosives in Anthracite Mines M27

Safety Code for the Prevention of Dust Explosions in Pulverizing Systems for Sugar and Cocoa (Revision of Z12b-1931)

Safety Code for Coal Pneumatic Cleaning Plants (Revision of Z12f-1930)

Safety Code for Prevention of Dust Explosions in Wood Flour Manufacturing Establishments (Revision of Z12g-1930)

Safety Code for the Prevention of Dust Ignitions in Spice Grinding Plants (Revision of Z12h-1931)

Safety Code for the Use of Inert Gas for Fire and Explosion Prevention (Revision of Z12i-1931)

Safety Code for the Prevention of Dust Explosions in Starch Factories (Revision of Z12.2-1935)

Safety Code for the Prevention of Dust Explosions in Flour and Feed Mills (Revision of Z12.3-1935)

Safety Code for Installation of Pulverized Fuel Systems (Revision of Z12.1-1935)

Safety Code for Prevention of Dust Explosions in Woodworking Plants (Revision of Z12.5-1935)

Approval of Standard Withdrawn by ASA

American Standard Rules Governing the Preparation of Micrographs of Metals and Alloys (Z30.1-1936)

American Standard Specifications for Steel for Bridges (G18-1936)

American Standard Specifications for Steel for Buildings (G19-1936)

American Tentative Standard Method of Test for Expressible Oil and Moisture in Paraffin Waxes (Z11.27-1932)